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PLANT PHYSIOLOGY IN SECONDARY SCHOOLS¹

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The subject—"Plant Physiology in Secondary Schools"—should not imply that this phase of botany is to be presented as an isolated subject in these schools, but rather that plant structures are always to be studied in the light of the functions they perform. No one, probably, has realized better than Lloyd the nature of the botany course that should be presented in this grade of school. He emphasizes the presentation of every phase of the science, and would always make structures significant by viewing them in the light of their functions and adaptations. I would not attempt to improve upon his recommendations for such a course, but I do wish to emphasize one point in this matter of botany teaching.

There is no subject that has more interesting human bearings than has botany when presented from the physiological side, and this should be brought out when teaching it. Emerson has said, "In the leaf progress begins." In studying photosynthesis the child should be made to see the fundamental nature of the process as did Emerson. There is hardly a phase of the subject that does not have a vital bearing upon the fundamental process of food production. Let us notice two illustrations: In a well-rounded, elementary course cross-fertilization is of course presented. The Department of Agriculture has recently demonstrated that it can increase the yield of apples by as high as 60 per cent. by alternating varieties of trees that mature their pollen at the same time, and thereby securing cross-fertilization between different varieties.

Excretion of the roots of plants is a subject studied in ele-

¹ Abstract of paper read before the Annual Conference of Botany and Zoölogy held in connection with the Twentieth Educational Conference of the Academic and High Schools in Relations with the University of Chicago, November 9, 1907.

mentary courses. The Department of Agriculture has found that the running out of soil is not due to the plants using up all the available phosphates and nitrates but to excreted products of the root system, which act as toxins to the growing plants.

BIOLOGY IN THE SECONDARY SCHOOLS OF THE CENTRAL STATES

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Secondary education is in a chaotic and unsatisfactory condition. The present curriculum is of mediaeval origin, and fitted more nearly to the needs and possibilities of the education of the leisure classes of the Middle Ages than to the requirements of the productive individual of the present day.

A new course of study which shall freely recognize the life-interests and activities of the modern citizen, and which shall take the results of scientific discovery of the past one hundred years into large account is demanded.

This radical change in our educational programme is of extreme importance from many points of view; it can be brought about only through a stiff fight with established customs, prejudice, and self-interests. The science teachers of our secondary schools are, for several reasons, the ones who must make this fight.